

--57. (new) The use according to Claim 55, involving the use of a medium which transits from a viscosity  $V1$  of between 100 and 10 000 mPa.m<sup>-1</sup>.s<sup>-1</sup> at a temperature  $T1$  of between 15 and 30°C to a viscosity  $V2$  which is greater than  $V1$  by a factor of between 2 and 100 at a temperature  $T2$  of the order of 40°C or higher and comprises between 1 g/100 ml and 8 g/100 ml of copolymers possessing

- an average molecular mass of between 500 000 and 3 000 000 or a number of atoms along the main skeleton of between 7 000 and 90 000,
- a fraction by mass of segments with LCST of between 2.5% and 15%, and
- an average molecular mass of segments with LCST of between 4 000 and 30 000 or an average number of atoms along a segment with LCST of between 60 and 600,

to separate products of reaction of DNA sequences, DNA duplexes of less than 1 000 base pairs, denatured proteins or synthetic or natural polymers having a molecular mass of between 20 000 and 1 000 000.

--58. (new) The use according to Claim 55, involving the use of a medium which transits from a viscosity V1 of between 100 and 10 000 mPa.m<sup>-1</sup>.s<sup>-1</sup> (SI unit) at a temperature T1 of between 15 and 30°C to a viscosity V2 which is greater than V1 by a factor of between 2 and 100 at a temperature T2 of the order of 40°C or higher and comprises between 0.1 g/100 ml and 5 g/100 ml of copolymers possessing

- an average molecular mass greater than 500 000 or a number of atoms along the main skeleton greater than 7 000,
- a fraction by mass of segments with LCST of between 2% and 15%, and
- an average molecular mass of the segments with LCST greater than 4 000 or an average number of atoms along a segment with LCST greater than 90,

to separate DNA duplexes having a size of between 500 bases and several millions of base pairs, or particles such as latexes, whole cells, whole chromosomes or organelles.

--59. (new) The use according to Claim 55, which comprises the following steps:

- selecting the said separation medium according to the characteristics of the species to be separated;
- introducing this medium into a separating channel of an electrophoresis apparatus in a sufficient quantity to constitute its separation medium, the said separating channel being maintained at a temperature in the region of the temperature T1;
- placing a significant proportion of the channel at the temperature T2, either prior to or following the introduction of a sample;
- introducing a quantity of sample at the inlet of the separating channel;
- carrying out the separation at a temperature of the order of T2 in the thermostated portion of the channel; and